

Science Department:

400Z Earth Science 5 Credits (No pre-requisite, incoming freshman): This course attempts to provide students with an understanding and appreciation of the nature of their home planet. The course begins with the investigation of the universe where our planet is believed to have had its origin. It progresses to the structure, use and abuses of our planet by man.

401Z Introduction to Physical Science 5 Credits (Pre-requisite: B or higher in 8th grade science or teacher recommendation.): This is a course in introductory physical science for academic 9th graders as an alternative to earth science. The purpose of the course is to give students a beginning knowledge of principles of physical science. This is accomplished through classroom readings, lectures, class discussions, teacher demonstrations and most importantly, by student experimentation. IPS is intended to serve as a solid foundation for later courses in chemistry and physics.

420H Biology Honors (9) 5 Credits (Pre-requisite: Top 10% of their class in math and science or teacher recommendation.): The major themes of the course are repair and how hypothesis, prediction, and controlled experimentation have helped scientists to understand repair in the biotic world. In ecology, energy flow and succession are used to understand repair in the community. As the origin of life on earth is discussed, mechanisms such as respiration, intermediate metabolism and photosynthesis are studied as mechanics of repair of the individual.

Genetic systems are considered as information sources for repair of the individual, and reproduction and natural selection are considered as mechanisms for repair of the species. Traditional organ systems are considered during the fourth marking period from a comparative point of view, emphasizing common functions necessary for repair and maintenance of homeostasis.

420Z Biology (10) 5 Credits (Pre-requisite: Class is for average or slightly above average 10th graders with one year of science): This course begins with a consideration of how facts and assumptions are used in the solving of scientific problems. Changing attitudes and the invention of the microscope are emphasized as we consider the transition from Natural Philosophy to Modern Science. This is discussed in terms of the Scientific Revolution of the 17th Century.

Problems associated with biological evolution are dealt with as a plausible way to account for the changing variety of life on Earth. As the course progresses, genetic continuity is stressed in terms of nucleic acid genetic coding. This involves an understanding of the cell as the basic unit of all life. The latter part of the course emphasizes the anatomy and physiology of various organ systems.

425Z Preparation for Physical Science 5 Credits (Pre-requisite: 10th graders in the honors track with a B or higher in Biology Honors.): This course is designed as an introduction to topics in both Chemistry and Physics. This course is taken during the student's sophomore year and is a prerequisite for Honors Chemistry in the junior year and Honor Physics in the senior year.

This part of the course serves as an introduction to elementary topics in chemistry, which include matter and energy, measurement in chemistry such as metric system temperature and heat, exponential notation, the composition of matter, chemical symbols, law of definite composition, physical and chemical changes, atomic structure of atoms and periodic laws and relationships in the arrangement of the modern periodic table.

P.P.S. Physics: This part of the course serves as an introduction to some elementary topics in physics including motion, force and light. The topics are treated in a way to show the relationship between science and mathematics. Students are expected to use basic ideas from Algebra and Geometry to solve problems, which originate in the laboratory.

430Z Chemistry 5 Credits (Pre-requisite: Two years of science): This course studies the composition of matter and the changes, which it undergoes. The material presented includes the structure of the atom, the history of its "discovery", the use and importance of the periodic table, important elements and their compounds, stoichiometry, and acids and bases. Laboratory work is done so as to supplement classroom work, and to maintain and increase a general interest in the material presented during class. The course is conducted six periods a week all year, which includes a double class period for labs, and carries six credits.

430H Chemistry Honors 5 Credits (Pre-requisite: Biology Honors or I.P.S., P.P.S.): This course is designed to meet the needs of serious college bound students who intend to major in science and/or engineering. The course is designed to allow the students to study those topics in Modern Chemistry in great depth, to encourage those who wish to take advanced placement, to make students aware of chemistry as tremendous body of knowledge which encompasses all disciplines and human endeavors. To introduce students to rigorous study in advanced topics such as Organic Chemistry, Nuclear Chemistry, qualitative and quantitative analysis, rates of reactions, chemical equilibrium, electrochemistry, solution and acid-base theories and related laboratory work. This course is an excellent preparation for college chemistry.

435Z Project Physics 5 Credits (Pre-requisite: At least two years of science): This course is an introductory one-year physics program for high school students that present a core of coherent ideas in an integrated learning sequence. Project physics includes coherent ideas that deal with good physics and can be related to a clear story life. Besides "pure physics", the course shows how physics connects to other sciences, particularly astronomy. The structure of the course allows students and teachers to select and emphasize aspects, which interest them most. The mathematical content of the course is kept to a level which is necessary to the course material and understandable to the student. The course offers ample opportunity to explore further or more deeply any selection or additional topic.

435H PSSC Physics Honors 5 Credits (Pre-requisite: B or higher in Biology Honors and Chemistry Honors.): This course is an in-depth treatment of classical topics in physics, including mechanics, thermodynamics, electricity and magnetism. The topics are treated on a level up to and including trigonometry. Ultimately it is hoped that the course will provide an initial framework for later work in physics. The course is conducted six periods a week all year which includes a double class period for lab and carries six credits.

440Z Human Biology 5 Credits (Pre-requisite: B or higher in biology or teachers recommendation.): This course is designed to provide opportunity to study the interactions within the human body. This includes anatomy, microscopic structure, normal function, disease states, physical assessment, and medical intervention will be considered.

Laboratory work will include dissection, microscopy, and chemical tests such as those used in clinical and forensic laboratories. The course will be of value to those planning careers in Bio-Medical related areas such as Nursing, Medical Technology, X-Ray Technician, Physical Therapist, Physical Educator, and Lab Technician.

441H Advanced Biology Honors 5 Credits (Pre-requisite: B or higher in Biology and Chemistry.): This course begins with a method of thought. Aspects of mechanistic philosophy are discussed and causality is used throughout the course to explain processes. Change is a continuous theme as many levels of organization are considered. Responses are understood to be caused by control systems, biological succession by interspecific selection and evolution by intraspecific selection. Consideration of the origin of the state and understanding of the forces that molded the condition achieve knowledge of biological states.

441P AP Biology 5 Credits (Pre-requisite: B or higher in honors track courses, Biology Honors, P.P.S., Chemistry Honors.): This course is designed to provide students with an opportunity for further study in biology, and/also to gain college credit for the course. A heavy emphasis will be placed on the student's ability to read, outline and understand the text. Summer reading assignments will be included.

Biology is not a subject to be learned primarily from books or computers. An understanding of biology means being personally in touch with the biosphere, observing living organisms, and discovering for ones self how they function. Therefore, the biology curriculum contains personal observations through fieldwork, and experimentation throughout its study. As a result of studying biology, students should be able to make more enlightened decisions involving themselves and their relationships within the biosphere.

450Z Environmental Science 5 Credits (Pre-requisite: At least two years of science.): This course helps develop an awareness of the environment by presenting Earth as the only known viable habitat for people and other organisms. It introduces the basic ecological concepts and ideas that form the study of the environment. It will provide a summary of climate conditions, plant, and animals that characterize the world's terrestrial and aquatic biomes. The course will address environmental concerns population growth, energy and pollution and land management as related to people